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"MARINE LIFE LITERATURE SEARCH FOR GULF OF ALASKA AND GEORGE'S BANK"

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The investigation into marine life possibly affected by explosive severing of-oil wellheads has focused on two areas: (1) the Alaskan Gulf, and (2) George's Bank, with the former receiving greater attention.

After a thorough literature search we have: (1) compiled a fruitful source of conformation on the Alaskan Gulf, (2) located an exceptionally thorough data bank for George's Bank, and (3) established practical limits on the problem of fishes swimbladders.

The Outer Continental Shelf Environmental Program (OCSEAP) was initiated in 1974 by the National Oceanic and Atmospheric Administration (NOAA). Its extensive studies have provided a wealth of information for our purposes and Figure 1 depicts the areas of concern. Table I is an example of data on fish from one of the areas. Figures 2 through 5 represent average catches of crustaceans by area. This information is cited only as an example of the information available from OCSEAP.

Another fertile source is the two volume "Alaska's Fisheries Atlas" published by the State of Alaska Department of Fish and Game. It emphasizes three items of concern: (1) Fish Species Accounts concentrates on each individual species of fish, (2) Area Accounts emphasizes the human-fish interface, and (3) Fish Distribution Maps. A bibliography of further references on Alaska is attached.

Table 2 lists the commercially Important Shell and Fin Fish of the George's Bank. Should this area become the focus of future work, a two volume reference is available from the National Marine Fisheries Service, North East Fisheries Center, Woods Hole, Massachusetts 02543: It is entitled "Summary for George's Bank and Southern New England Fisheries Grounds 1965-1974." This area was subdivided into smaller areas whose dimensions were 1' latitude by 1' longitude and samples of fishes were taken down to depths as great as 1,000 feet. It is by far the most detailed study of this kind encountered in our literature search.

The literature search on the morphology of the swimbladder of fishes, which is needed for fish-kill calculations, resulted in little useful data. Apparently, marine scientists are simply not interested in publishing such data. Dr. Maurice Lynch, Sea Grant Director of the Virginia Institute of Marine Science, concurred in this. However, calculations of fish swimbladders are frequently made by workers in the field utilizing the approximation that the swimbladder volume is between 2% and 10% of the total fish volume. Fortunately, data on the average length and weight of approximately 250 species of finfish and shellfish caught from Cape Hatteras to Nova Scotia can be obtained from Woods Hole. Similar information can be obtained for the region extending from Morehead City, North Carolina, to the Florida Keys, from the National Marine Fisheries Service, Southeast Fisheries Center at Beaufort, North Carolina.

Although the Gulf of Mexico was not addressed in this investigation, marine life in the Gulf has been thoroughly documented and there would be no difficulty in obtaining information about a particular site if an assessment of explosion effects is needed.

BIBLIOGRAPHY

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2. Clam, Mussel and Oyster Resources of Alaska, A. J. Paul and Howard M. Feder, University of Alaska, Institute of Marine Science, IMS Report No. 76-4, Sea Grant Report No. 76-6, April 1976
3. Alaska and Law of the Sea National Patterns and Trends of Fishery Development in the North Pacific, Eugene H. Buck, Environmental Information and Data Center

TABLE I
Fish of the Northeast Gulf of Alaska

<u>Family and Species</u>	<u>Common Name</u>
Clupeidae	
<u>Alosa sapidissima</u> (Wilson)	American shad
<u>Clupea harengus pallasi</u> Valenciennes	Pacific herring
Salmonidae	
<u>Oncorhynchus gorbuscha</u> (Walbaum)	Pink salmon
<u>O. keta</u> (Walbaum)	Chum salmon
<u>O. kisutch</u> (Walbaum)	Coho salmon
<u>O. nerka</u> (Walbaum)	Sockeye salmon
<u>O. tschawytscha</u> (Walbaum)	Chinook salmon
<u>Salmo clarki</u> Richardson	Cutthroat trout
<u>S. gairdneri</u> Richardson	Rainbow trout
<u>Salvelinus malma</u> (Walbaum)	Dolly varden
<u>S. alpinus</u> (Linnaeus)	Arctic char
<u>Thymallus arcticus</u> (Pallas)	Arctic grayling
Gadidae	
<u>Gadus macrocephalus</u> Tilesius	Pacific cod
<u>Merluccius productus</u> (Ayres)	Pacific hake
<u>Microgadus proximus</u> (Girard)	Pacific tomcod
<u>Theragra chalcogramma</u> (Pallas).	Walleye pollock
Anoplopomatidae	
<u>Anoplopoma fimbria</u> (Pallas)	Sablefish
<u>Eriolepis zonifer</u> (Lockington)	Skilfish
Pleuronectidae	
<u>Atheresthes stomias</u> (Jordan and Gilbert)	Arrowtooth flounder
<u>Embassichthys bathybius</u> (Gilbert)	Deepsea sole
<u>Eopsetta jordani</u> (Lockington)	Petrale sole
<u>Glyptocephalus zachirus</u> Lockington	Rex sole
<u>Hippoglossoides elassodon</u> Jordan and Gilbert	Flathead sole
<u>Hippoglossus stenolepis</u> Schmidt	Pacific halibut
<u>Isopsetta isolepis</u> (Lockington)	Butter sole
<u>Lepidotretta bilineata</u> (Ayres)	Rock sole
<u>Limanda aspera</u> (Pallas)	Yellowfin sole
<u>Lyopsetta exilis</u> (Jordan and Gilbert)	Slender sole
<u>Microstomus pacificus</u> (Lockington)	Dover sole
<u>Parophrys vetulus</u> Girard	English sole
<u>Platichthys stellatus</u> (Pallas)	Starry flounder

TABLE I (continued)

Pleuronectidae (cont.)

<u>Pleuronichthys coenosus</u> Girard	C-O sole
<u>P. decurrens</u> Jordan and Gilbert	Curlfin sole
<u>Psettichthys melanostictus</u> Girard	Sand sole
<u>Reinhardtius hippoglossoides</u> (Walbaum)	Greenland halibut

Scorpaenidae

<u>Sebastes aleutianus</u> (Jordan and Evermann)	Rougheye rockfish
<u>S. alutus</u> (Gilbert)	Pacific ocean perch
<u>S. babcocki</u> (Thompson)	Redbanded rockfish
<u>S. brevispinis</u> (Bean)	Silvergray rockfish
<u>S. caurinus</u> Richardson	Copper rockfish
<u>S. ciliatus</u> (Tilesius)	Dusky rockfish
<u>S. crameri</u> (Jordan)	Darkblotched rockfish
<u>S. diploproa</u> (Gilbert)	Calico rockfish
<u>S. elongatus</u> Ayres	Greenstriped rockfish
<u>S. entomelas</u> (Jordan and Gilbert)	Widow rockfish
<u>S. flavidus</u> (Ayres)	Yellowtail rockfish
<u>S. helvomaculatus</u> Ayres	Rosethorn rockfish
<u>S. maliger</u> (Jordan and Gilbert)	Quillback rockfish
<u>S. melanops</u> Girard	Black rockfish
<u>S. mystinus</u> (Jordan and Gilbert)	Blue rockfish
<u>S. paucispinis</u> Ayres	Bocaccio
<u>S. proriger</u> (Jordan and Gilbert)	Redstripe rockfish
<u>S. ruberrimus</u> (Cramer)	Yelloweye rockfish
<u>S. variegatus</u> Quast	Harlequin rockfish
<u>S. zacentrus</u> (Gilbert)	Sharpchin rockfish
<u>Sebastolobus alascanus</u> Bean	Shortspine thornyhead
<u>S. altivelis</u> Gilbert	Longspine thornyhead

Scombridae

<u>Sarda chiliensis</u> (Cuvier)	Pacific bonito
<u>Scomber japonicus</u> Houttuyn	Chub mackerel
<u>Thunnus alalunga</u> (Bonnaterre)	Albacore
<u>T. thynnus</u> (Linnaeus)	Bluefin tuna

Bothidae

<u>Citharichthys sordidus</u> (Girard)	Pacific sanddab
<u>C. stigmatus</u> Jordan and Gilbert	Speckled sanddab

Osmeridae

<u>Hypomesus pretiosus</u> (Girard)	Surf smelt
<u>Mallotus villosus</u> (Müller)	Capelin
<u>Osmerus mordax</u> (Mitchill)	Rainbow smelt

TABLE I (continued)

Osmeridae (cont.)

Spirinchus starksii (Fisk)
S. thaleichthys (Ayres)
Thaleichthys pacificus (Richardson)

Night smelt
 Longfin smelt
 Eulachon

Hexagrammidae

Hexagrammos decagrammus (Pallas)
H. lagocephalus (Pallas)
H. octogrammus (Pallas)
H. stelleri Tilesius
Ophiodon elongatus Girard
Pleurogrammus monopterygius (Pallas)

Kelp greenling
 Rock greenling
 Masked greenling
 Whitespotted greenling
 Lingcod
 Atka mackerel

Zoarcidae

Bothrocara brunneum (Bean)
B. molle Bean
Lycenchelys jordani (Evermann and Goldsborough)
Lycodapus fierasfer Gilbert
L. grossidens Gilbert
L. mandibularis Gilbert
Lycodes brevipes Bean
L. diapterus Gilbert
L. palearis Gilbert
Lycodopsis pacifica (Collett)

Twoline eelpout
 Soft eelpout
 Shortjaw eelpout
 Blackmouth eelpout
 Bigtooth eelpout
 Pallid eelpout
 Shortfin eelpout
 Black eelpout
 Wattled eelpout
 Blackbelly eelpout

Trichodontidae

Trichodon trichodon (Tilesius)

Pacific sandfish

Bathymasteridae

Bathymaster signatus Cope
Ronquilus jordani (Gilbert)

Searcher
 Northern ronquil

Stichaeidae

Anoplarchus insignis Gilbert and Burke
A. purpureascens Gill
Bryozoichthys marjorius McPhail
Chiropogon nugator (Jordan and Williams)
C. polyactocephalus (Pallas)
Lumpenella longirostris (Evermann and Goldsborough)
Lumpenus maculatus (Fries)
L. sagitta Wilimovsky
Phytichthys chirurgus (Jordan and Gilbert)
Poroclinus rothrocki Bean
Xiphister atropurpureus (Kittlitz)

Slender cockscomb
 High cockscomb
 Pearly prickleback
 Mosshead warbonnet
 Decorated warbonnet
 Longsnout prickleback
 Daubed shanny
 Snake prickleback
 Ribbon prickleback
 Whitebarred prickleback
 Black prickleback

TABLE I (continued)

Pholidae

Apodichthys flavidus Girard
Pholis laeta (Cope)
Pholis ornata (Girard)

Penpoint gunnel
 Crescent gunnel
 Saddleback gunnel

Cryptacanthodidae

Delolepis gigantea Kittlitz
Lyconectes aleutensis Gilbert

Giant wrymouth
 Dwarf wrymouth

Ammodytidae

Ammodytes hexapterus Pallas

Pacific sand lance

Ptilichthyidae

Ptilichthys goodei Bean

Quillfish

Stromateidae

Icichthys lockingtoni Jordan and Gilbert

Medusafish

Melamphaeidae

Melamphaes lugubris Gilbert
Poromitra crassiceps (Günther)

Highsnout malamphid
 Crested malamphid

Lampridae

Lampris regius (Bonnaterre)

Opah

Trachipteridae

Trachipterus altivelis Kner

King-of-the-salmon

Cottidae

Blepsias bilobus Cuvier
Cottus aleuticus Gilbert
C. asper Richardson
Dasycottus setiger Bean
Hemilepidotus hemilepidotus (Tilesius)
H. jordani Bean
H. spinosus (Ayres)
Hemitripterus bolini (Myers)
Icelinus borealis Gilbert
I. oculatus Gilbert
Icelus spiniger Gilbert

Crested sculpin
 Coastrange sculpin
 Prickly sculpin
 Spinyhead sculpin
 Red Irish lord
 Yellow Irish lord
 Brown Irish lord
 Bigmouth sculpin
 Northern sculpin
 Frogmouth sculpin
 Thorny sculpin

TABLE I (continued)

Cottidae (cont.)

<u>Leptocottus armatus</u> Girard
<u>Malacocottus kincaidi</u> Gilbert and Thompson
<u>Myoxocephalus polyacanthocephalus</u> (Pallas)
<u>Psychrolutes paradoxus</u> Günther
<u>Radulinus asprellus</u> Gilbert
<u>Rhamphocottus richardsoni</u> Günther
<u>Triglops macellus</u> (Bean)
<u>T. pingeli</u> Reinhardt

Pacific staghorn sculpin
Blackfin sculpin
Great sculpin
Tadpole sculpin
Slim sculpin
Grunt sculpin
Roughspine sculpin
Ribbed sculpin

Agonidae

<u>Agonus acipenserinus</u> Tilesius
<u>Anoplagonus inermis</u> (Günther)
<u>Asterotheca alascana</u> (Gilbert)
<u>A. infraspinata</u> (Gilbert)
<u>Bathyagonus nigripinnus</u> Gilbert
<u>Bothragonus swani</u> (Steindachner)
<u>Hypsagonus quadricornis</u> (Cuvier)
<u>Pallasina barbata</u> (Steindachner)

Sturgeon poacher
Smooth alligatorfish
Gray starsnout
Spinycheek starsnout
Blackfin poacher
Rockhead
Fourhorn poacher
Tubenose poacher

Bathylagidae

<u>Bathylagus stilbius</u> (Gilbert)

California smoothtongue

Myctophidae

<u>Stenobrachius leucosparus</u> (Eigenmann & Eigenmann)
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Northern lampfish

Gasterosteidae

<u>Gasterosteus aculeatus</u> Linnaeus
<u>Pungitius pungitius</u> (Linnaeus)

Threespine stickleback
Ninespine stickleback

Anarhichadidae

<u>Anarhichthys ocellatus</u> Ayres

Wolf-eel

Notacanthidae

<u>Macdonaldia challengerii</u> (Valliant)
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Longnose tapirfish

Sphyraenidae

<u>Sphyraena argentea</u> Girard

Pacific barracuda

Opisthoproctidae

<u>Macropinna microstoma</u> Chapman

Barreleye

TABLE I (continued)

Bramidae

Brama japonica Hilgendorf

Pacific pomfret

Carangidae

Trachurus symmetricus (Ayres)

Jack mackerel

Zaproridae

Zaprora silenus Jordan

Prowfish

Scomberesocidae

Colobabis saira (Brevoort)

Pacific saury

Acipenseridae

Acipenser medirostris Ayres
A. transmontanus Richardson

Green sturgeon
 White sturgeon

Rajidae

Raja binoculata Girard
R. kincaidi Garman
R. rhina Jordan and Gilbert

Big skate
 Black skate
 Longnose skate

Cyclopteridae

Aptocyclus ventricosus (Pallas)
Careproctus giberti Burke
Eumicrotremus orbis (Günther)
Liparis dennyi Jordan and Starks

Smooth lumpsucker
 Small disk snailfish
 Pacific spiny lumpsucker
 Marbled snailfish

Petromyzontidae

Entosphenus tridentatus (Gairdner)
Lampetra japonica (Martens)

Pacific lamprey
 Arctic lamprey

Lemnidae

Cetorhinus maximus (Gunnerus)
Lamna ditropis Hubbs and Follett

Basking shark
 Salmon shark

Squalidae

Squalus acanthias Linnaeus

Spiny dogfish

Carcharhinidae

Prionace glauca (Linnaeus)

Blue shark

TABLE II
COMMERCIALLY IMPORTANT SHELL AND FIN FISH
OF THE GEORGE'S BANK

Haddock	<i>Melanogrammus Aeglefans</i>
Silver Hake (Whiting)	<i>Merluccius Bilinearis</i>
Red Hake	<i>Urophycis Chuss</i>
White Hake	<i>Urophycis Tenuis</i>
Atlantic Herring	<i>Clupea Harengus Harengus</i>
Atlantic Mackerel	<i>Scomber Scombrus</i>
Cod	Atlantic = <i>Gadus Morhua</i> ; Greenland Cod = <i>Gadus Ogac</i>
Pollock	<i>Pollachius Virens</i>
Redfish (Ocean Perch)	<i>Sebastes Marinus</i>
Swordfish	<i>Xiphias Gladius</i>
Yellowtail Flounder	<i>Limanda Ferruginea</i>
Winter Flounder (Grey Sole)	<i>Pseudopleuronectes Americanus</i>
American Plaice	<i>Hippoglossoides Platessoides</i>
Butterfish	<i>Peprilus Triacanthus</i>
Cusk	<i>Tautogolabrus Adasperus</i>
Sea Scallop	<i>Placopecten Magellanicus</i>
Surf Clam	<i>Spisula Solidissima</i>
Ocean Quahog	<i>Artica Islandica</i>
American Lobster	<i>Homarus Americanus</i>
Squid	<i>Loligo Pealii</i>

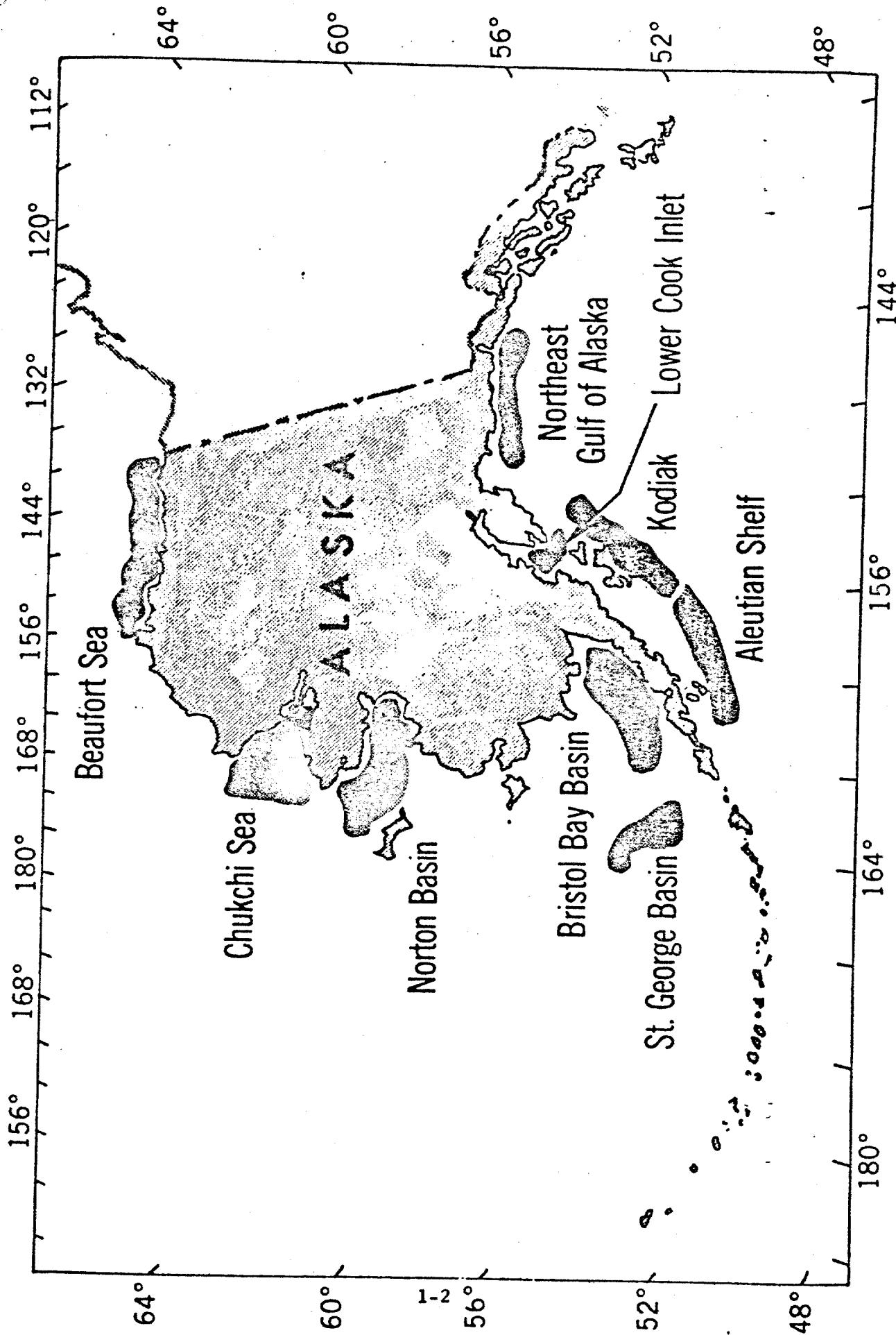


FIGURE 1. ALASKAN OUTER CONTINENTAL SHELF LEASE AREAS

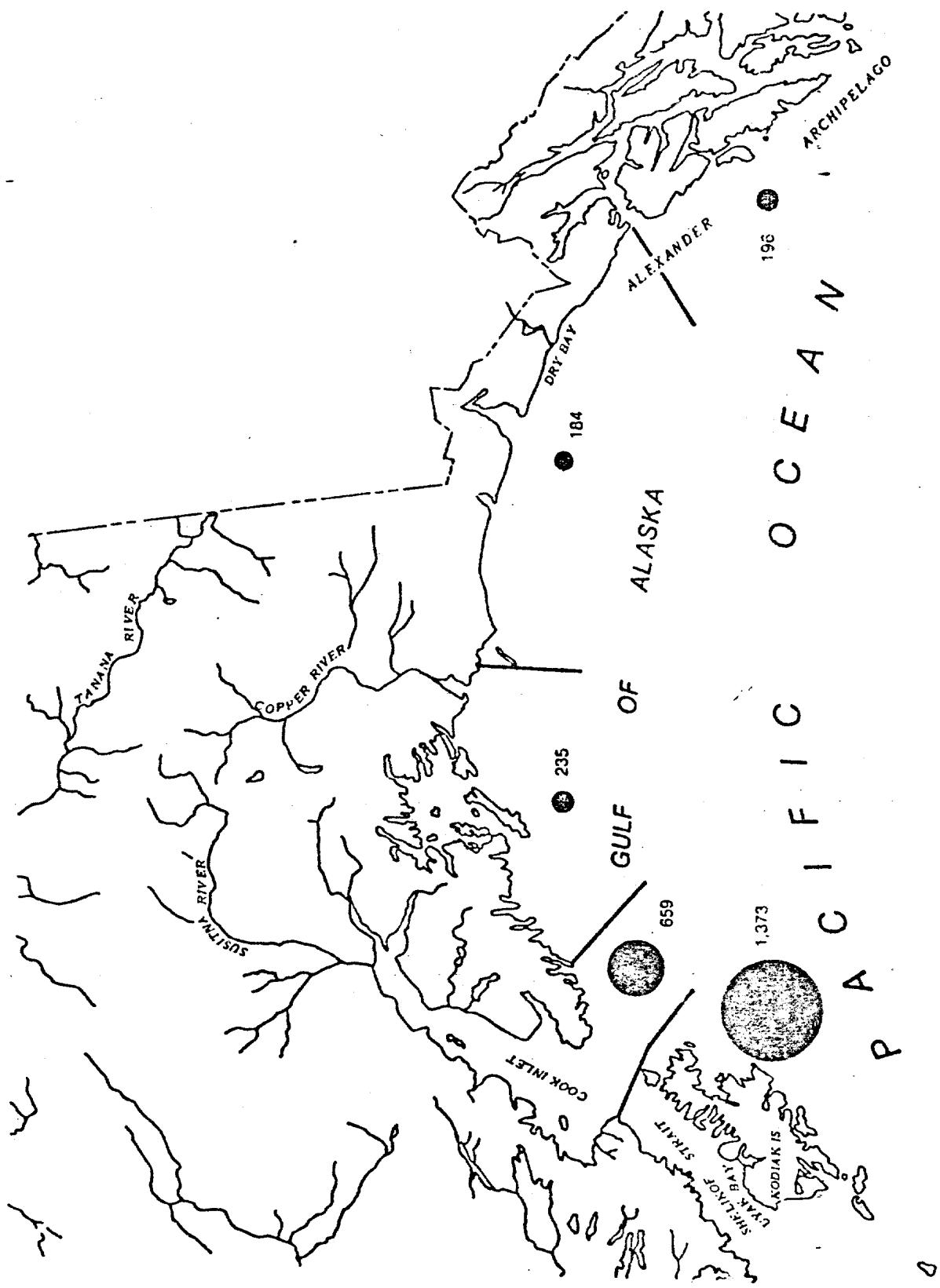


Fig. 2 Average catch in pounds per hour of trawling by regions for shrimp based on drags producing 10 pounds or more (Maturgo 1972).

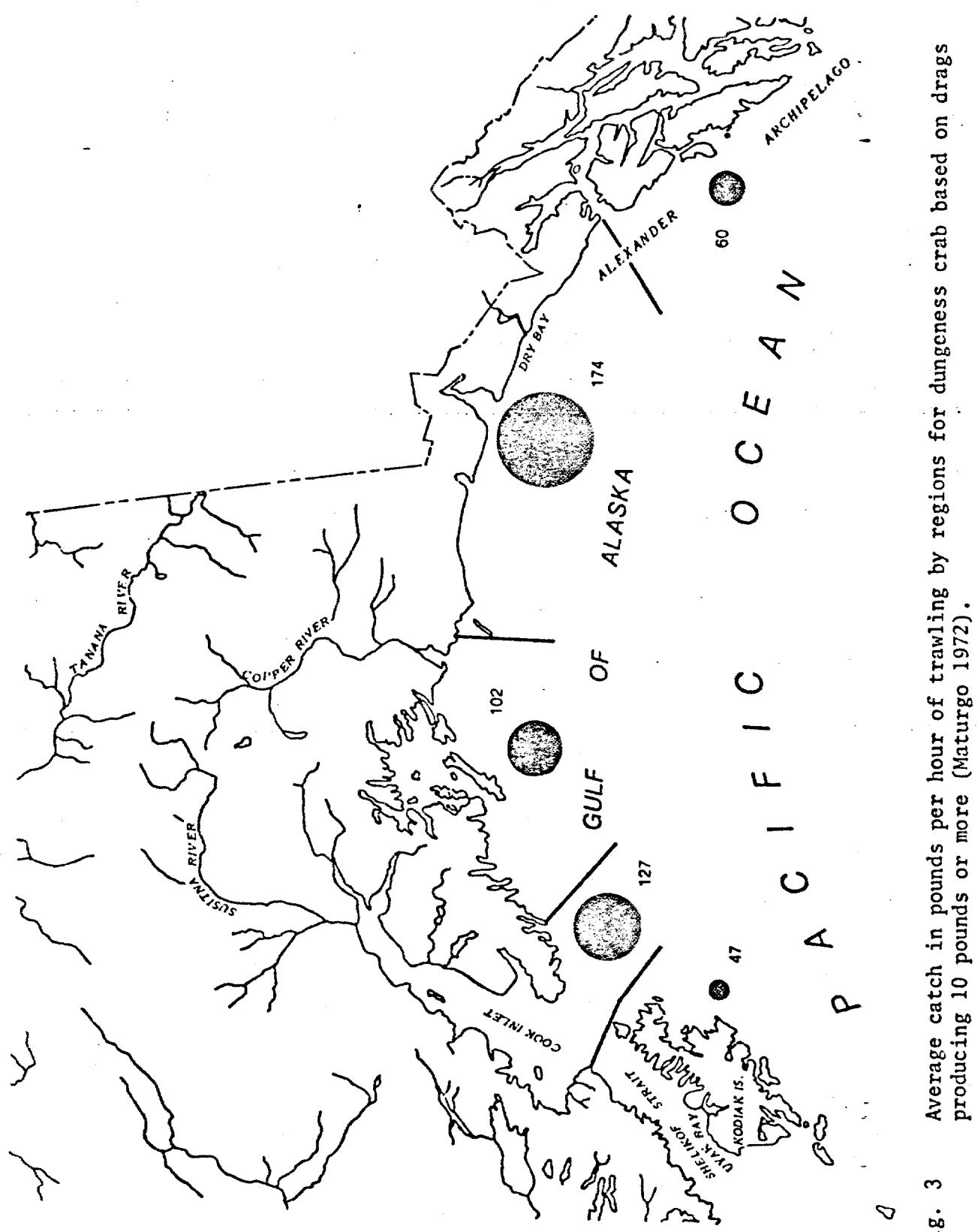


Fig. 3 Average catch in pounds per hour of trawling by regions for dungeness crab based on drags producing 10 pounds or more (Maturgo 1972).

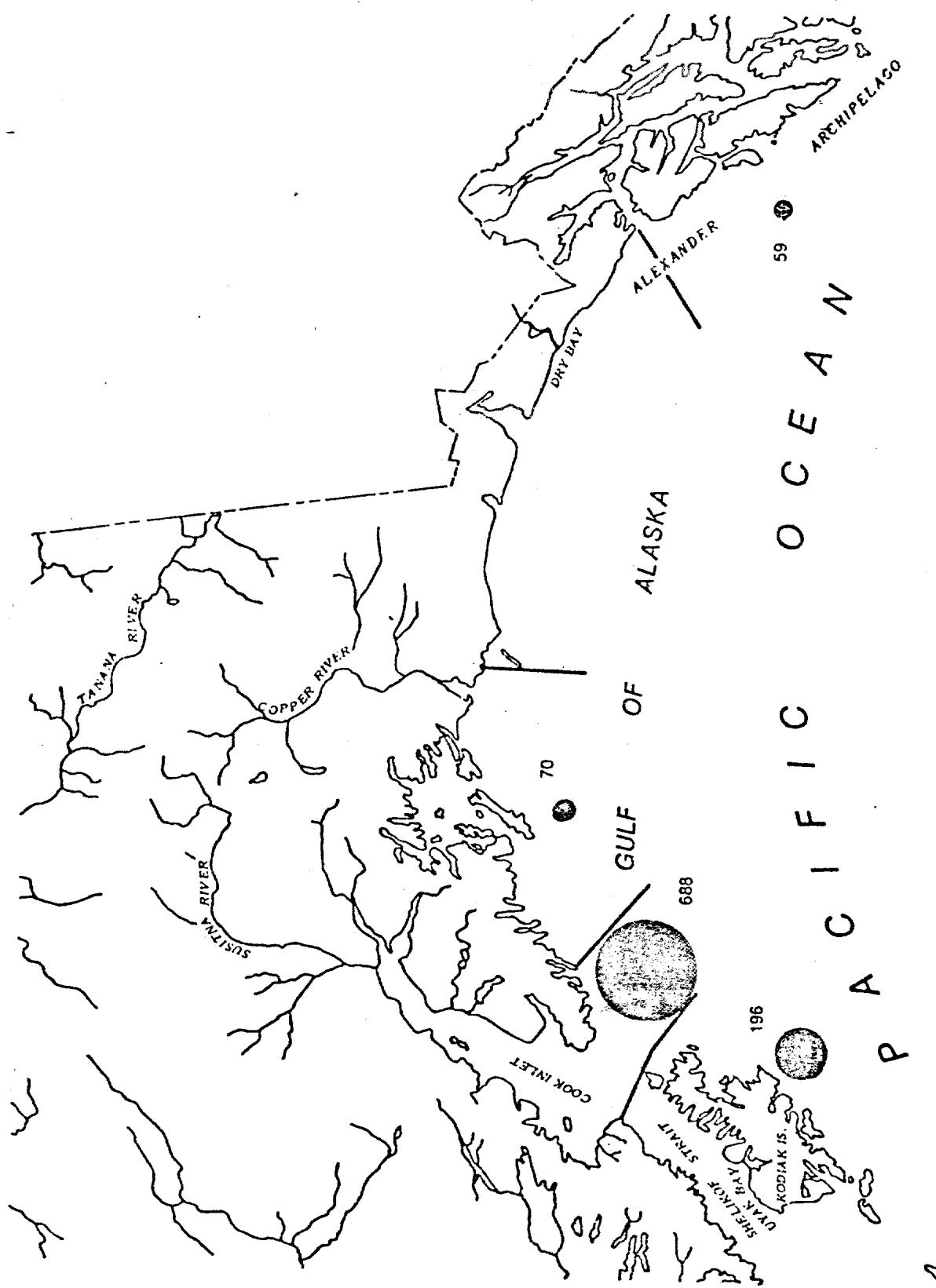


Fig. 4 Average catch in pounds per hour of trawling by regions for king crab based on drags producing 10 pounds or more (Maturgo 1972).

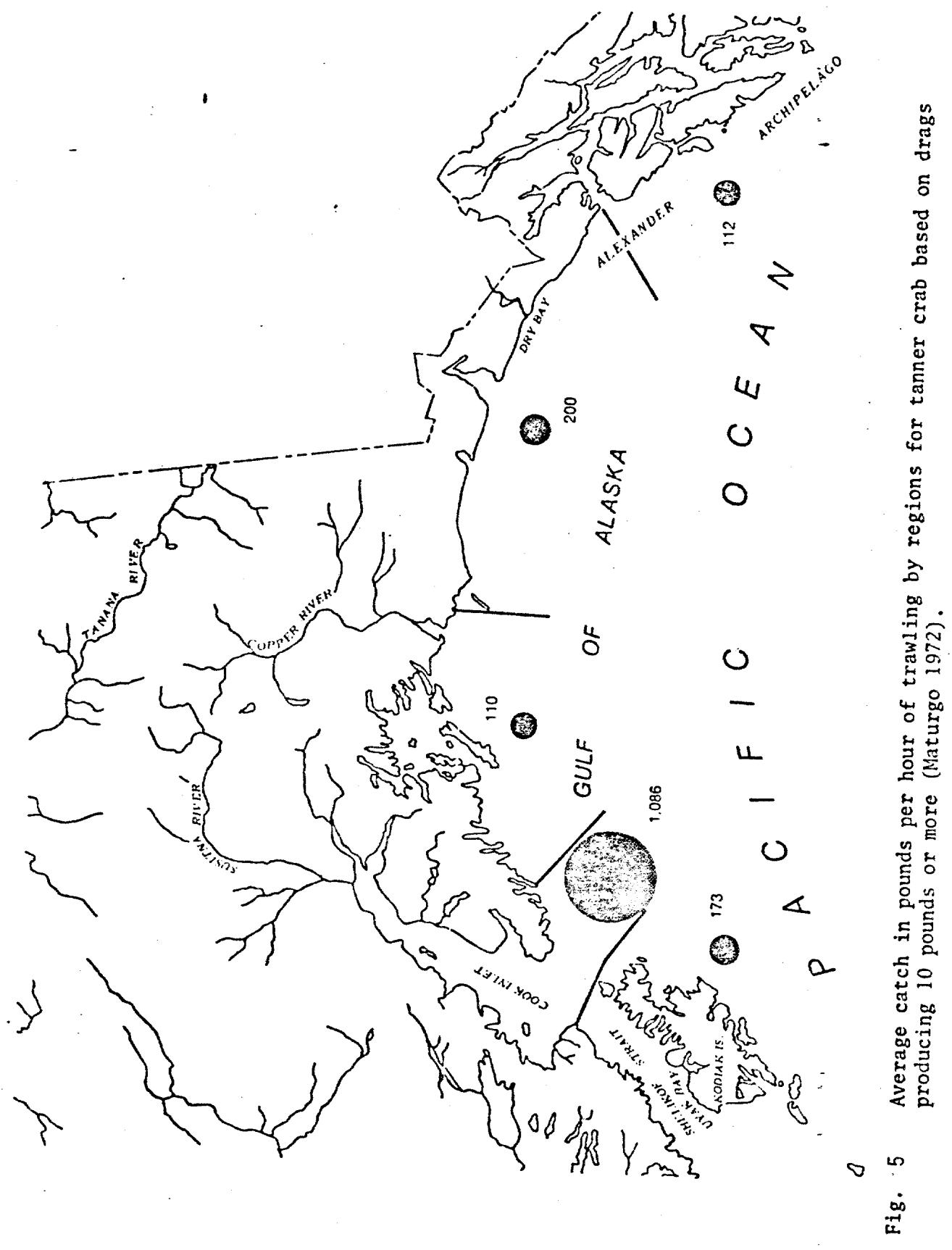


Fig. 5 Average catch in pounds per hour of trawling by regions for tanner crab based on drags producing 10 pounds or more (Maturgo 1972).

